II B.Tech. II Semester Supplementary Examinations May/June 2022
Probability and Statistics
(Common to CE & ME)

Max. Marks: 70   Time: 3 Hours
Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)
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Marks

UNIT–I

1. a) Given P(A)=1/4, P(B)=1/3 and P P(AUB) =1/2 , then evaluate (i) P(A/B),(ii) P(B/A) , (iii) P(A∩B^c), (iv) P(A^c/B^c)   **8M**

   b) A card is drawn from a pack of 52 playing cards. What is the probability of drawing black card.   **6M**

OR

2. a) A class consists of 6 girls and 10 boys. If a committee of 3 is chosen at random from the class, find the probability that (i) 3 boys are selected, (ii) exactly 2 girls are selected.   **8M**

   b) Two dice are thrown and their sum is 7. Find the probability that at least one of the dice shows up 2   **6M**

UNIT–II

3. a) A die is thrown 6 times. If getting an even number is a success, find the probabilities of (i) at least one success (ii)   3 successes (iii) 4 successes   **7M**

   b) A continuous random variable x has a probability density function

   $$f(x) = \begin{cases} \dfrac{(x+1)}{2}, & -1 \le x \le 1 \\ 0 & \text{else where} \end{cases}$$

   represents the density of a random variable x, then find $P(X \le 0)$, mean and variance.   **7M**

OR

4. For the normal distribution with mean 2 and standard deviation 4, evaluate

   (i) $P(-6 < x < 3)$, (ii) $P(x \ge 5)$ and (iii) $P(-4 < x < 4)$ **14M**

UNIT–III

5. a) The variance of population is 2. The size of the sample collected from the population is 169. What is the standard error of mean   **7M**

   b) A population consists of 5, 10, 14, 18, 13, 24. Consider all possible samples of size 2 which can be drawn without replacement from this population. Find the population mean and standard deviation, and mean and standard deviation of the sampling distribution of means.   **7M**

OR

6. a) A random sample of 100 teachers in a large metropolitan area revealed a mean weekly salary of Rs.487 with a standard deviation rs 48. With what degree of confidence can assert that the average weekly salary of all teachers in the metropolitan area is between 472 to 502?   **7M**

   b) What is the size of the smallest sample required to estimate an unknown proportion to within a maximum error of 0.06 with at least 95% confidence.   **7M**

UNIT–IV

7. In a random sample of 60 works, the average time taken by them to get work is 33.8min with a S.D of 6.1 min can we reject the null hypothesis $\mu = 15150$ min in the favour of alternative hypothesis $\mu > 15150$ at 0.05 level of significance. **14M**

OR

8. A manufacturer of electronic equipment subjects sample of two completing brands of transistors to an accelerated performance test. If 45 of 180transistors of the first kind and 34 of 120 transistors of the second kind fail the test. What he conclude at the level of significance $r = 0.05$ about the difference between the corresponding sample proportions. **14M**

UNIT–V

9. The following data give the number of air-craft accidents that occurred during the various days of a week

Day	Mon	Tue	Wed	Thu	Fri	sat
No.of accidents	15	29	13	12	16	15

Test whether the accidents are uniformly distributed over the week. **14M**

OR

10. Two random sample drawn from two normal populations have the variable values as below

Sample1	19	17	16	28	22	23	19	24	26			
Sample2	28	32	40	37	30	35	40	28	41	45	30	36

Obtain the estimate of the variance of the population and f test whether the two population have the same variance. **14M**

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II B.Tech. II Semester Supplementary Examinations May / June 2022

Electrical and Electronics Engineering

(Mechanical Engineering)

Max. Marks: 70   Time: 3 Hours

Answer *any five full questions* by choosing one question from each unit (5x14 = 70 Marks)

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Marks

UNIT–I

1. a) Define the following terms 1. Voltage 2. Current 3. Power 4. Energy   8M

   b) State ohm's law and its limitations.   6M

OR

2.   Four resistors of 2 ohm, 3 ohm, 4 ohm & 5 ohm respectively, are connected in parallel. What potential difference must be applied to the group in order that total power of 100 W may be absorbed?   14M

UNIT–II

3. a) With neat diagrams explain the working principle of DC Motor   8M

   b) What is back EMF?   6M

OR

4. a) Explain about losses of a DC Generator.   8M

   b) Draw and explain various characteristics of DC generators   6M

UNIT–III

5. a) Describe the construction details of single phase transformer   7M

   b) Explain working principle of operation of single phase Transformer   7M

OR

6.   Explain Open circuit and Short circuit tests on a single phase transformer with circuit diagrams.   14M

UNIT–IV

7. a) Explain construction of Bipolar Junction Transistor with figures.   10M

   b) Draw the characteristics of BJT   4M

OR

8. a) Explain how a Transistor work as an amplifier.   7M

   b) Explain about frequency response of a CE amplifier.   7M

UNIT–V

9.   Explain the principle of dielectric heating with relevant diagram   14M

OR

10. a) What are the functions of Electron gun and accelerating anode in the CRT   8M

    b) Explain the various applications of CRO   6M

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